



Orville Wright

Underwood & Underwood
Wilbur Wright

to the commencement exercises, and Orville took special subjects rather than a prescribed course in his final year. Mechanics fascinated them even in childhood. To earn pocket money they sold homemade mechanical toys. Orville started a printing business, building his own press. They later launched a weekly paper, the *West Side News*, with Wilbur as editor. Wilbur was 25 and Orville 21 when they began to rent and sell bicycles. Then they began to manufacture them, assembling the machines in a room above their shop. They built the "Van Cleve" bicycle.

Flying Experiments. After reading about the death of pioneer glider Otto Lilienthal in 1896, the brothers became interested in flying. They began serious reading on the subject in 1899, and soon obtained all the scientific knowledge of aeronautics then available. That same year they experimented for a day or two with a 5-foot (1.5-meter) biplane kite.

On the advice of the Weather Bureau (now the National Weather Service) in Washington, D.C., the Wrights selected for their experiments a narrow strip of sand called Kill Devil Hill, near the settlement of Kitty Hawk, N.C. In 1900, they tested their first glider that could carry a person. The glider measured 16 feet (5 meters) from wing tip to wing tip, and cost \$15 to build. They returned to Kitty Hawk in 1901 with a larger glider. They showed that they could control side-wise balance by presenting the right and left wings at different angles to the wind. But neither the 1900 or the 1901 glider had the lifting power they had counted on.

The Wrights concluded that all published tables of air pressures on curved surfaces must be wrong. They set up a 6-foot (1.8-meter) wind tunnel in their shop and began experiments with model wings. They tested more than 200 wing models in the tunnel. From the results of their tests, the brothers made the first reliable tables of air pressures on curved surfaces. These tables made it

possible for them to design a machine that could fly.

The brothers built a third glider and took it to Kitty Hawk in the summer of 1902. This glider, based on their new figures, had aerodynamic qualities far in advance of any tried before. With it, they solved most of the problems of balance in flight. They made nearly 1,000 glides in this model, and, on some, covered distances of more than 600 feet (180 meters). Their basic patent, applied for in 1903, relates to the 1902 glider.

First Airplane. Before leaving Kitty Hawk in 1902, the brothers started planning a power airplane. By the fall of 1903, they completed building the machine at a cost of less than \$1,000. It had wings 40½ feet (12 meters) long and weighed about 750 pounds (340 kilograms) with the pilot. They designed and built their own lightweight gasoline engine for the airplane.

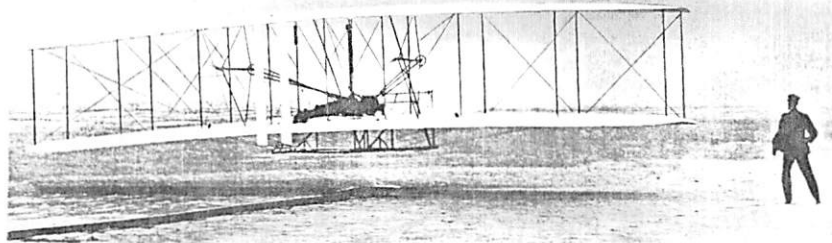
The Wrights went to Kitty Hawk in September, 1903, but a succession of bad storms and minor defects delayed their experiment until December 17. They were so sure of the accuracy of their calculations that they showed no surprise when the machine flew.

The Wrights continued their experiments at a field near Dayton in 1904 and 1905. In 1904, they made 105 flights, but totaled only 45 minutes in the air. Two flights lasted five minutes each. On Oct. 5, 1905, the machine flew 24.2 miles (38.9 kilometers) in 38 minutes, 3 seconds. When the Wrights first offered their machine to the U.S. government, they were not taken seriously. But by 1908 they closed a contract with the U.S. Department of War for the first military airplane. Meanwhile, they resumed experimental flights at Kitty Hawk which newspapers reported at great length.

Immediately after these trials, Wilbur went to France, where he aroused the admiration and enthusiasm of thousands. He made flights to altitudes of 300 feet (91 meters) and more. He arranged with a French company for the construction of his machine in France. When he returned to the United States, he made demonstration flights from Governors Island, N.Y., around the Statue of Liberty, up to Grant's Tomb, and back.

While Wilbur was in France, Orville made successful flights in the United States. On the morning of Sept. 9, 1908, he made 57 complete circles at an altitude of 120 feet (37 meters) over the drill field at Fort Myer, Va. He remained in the air one hour and two minutes, and set several records on the same day. On Sept. 17, however, while he was flying at 75 feet (23 meters), a blade of the right-hand propeller struck and loosened a wire of the rear rudder. The wire coiled about the blade and snapped it across the middle. The machine became dif-

Culver



The Wright Brothers' First Airplane reached a speed of about 30 miles (48 kilometers) per hour on its first flight in December, 1903.